REMARKS

This is intended as a full and complete response to the Final Office Action dated July 19, 2006, having a shortened statutory period for response set to expire on October 19, 2006. Please reconsider the claims pending in the application for the reasons discussed below.

Claims 1-18 remain pending in the application. Claims 1-18 are rejected. Reconsideration of the rejection of claims 10-18 is requested for reasons presented below.

Applicants propose canceling claims 1-9. Applicants submit that the changes proposed herein reduce the issues for appeal and do not introduce new matter or raise new issues. Applicants respectfully request entry of the amendment.

Claims 1-3, 5, and 7-9 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Cheng, et al.* (U.S. Patent No. 6,649,538). Applicants submit that the rejection of claims 1-3, 5, and 7-9 is moot as Applicants have proposed canceling claims 1-3, 5, and 7-9.

Claims 10-12, 14, and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Cheng, et al.* as applied to claims 1-3, 5, and 7-9 in view of *Kiryu, et al.* (U.S. Publication No. 2004/0053472 A1). The Examiner states that *Cheng, et al.* describes a method for forming a nitride gate oxide including a nitriding annealing process in an ambient including NH_3 and then exposing the gate oxide to a plasma nitriding treatment comprising a nitrogen source and that *Kiryu, et al.* discloses an apparatus for forming a gate insulator which enables forming a gate of a high dielectric constant using a cluster tool with chambers that performs processes including film forming, annealing, and removal of oxide films. The Examiner concludes that it would have been obvious to perform *Cheng, et al.'s* process in the apparatus of *Kiryu, et al.* where a first chamber is used for heating the substrate in an NH_3 atmosphere and a second chamber is used for exposing the substrate to a plasma containing a nitrogen source. The Examiner asserts that one would have been motivated to do so because *Cheng, et al.* discloses a method for forming a high dielectric constant gate insulator (silicon oxynitride) and *Kiryu, et al.* teaches that the apparatus can be used to form a

high dielectric constant gate insulator such as silicon oxynitride using a substrate that has a layer of silicon dioxide (paragraph [0014]) where the insulator is not contaminated by the atmosphere and is formed with low burden. The Examiner further notes that *Kiryu, et al.* states that the processing chambers of the apparatus can be used to perform the processes that are used by *Cheng, et al.* to form the film (such as annealing and film forming) and concludes that one would have a reasonable expectation of success in forming the silicon oxynitride film without contamination of the film as well as with low burden. Applicants respectfully traverse the rejection.

As acknowledged by the Examiner, *Cheng, et al.* does not teach using an integrated system to form a silicon oxynitride gate dielectric wherein the structure is heated in a NH_3 atmosphere in a first processing chamber and then transferred to a second chamber where it is exposed to a plasma. *Kiryu, et al.* describes a method that includes depositing a first insulation film that can be a SiON layer and then depositing a second insulation film that is a high dielectric constant film (paragraphs [0009] and [0010], Figure 4). *Kiryu, et al.* discloses that both the first and second films may be deposited in the same chamber and that a first film of SiON may be provided by oxidizing a silicon substrate in the chamber and then exposing the substrate in the same chamber to nitrogen radicals (paragraphs [0069]-[0080]). However, Applicants submit that the combination of *Cheng, et al.* and *Kiryu, et al.* does not teach or suggest a process that includes forming a silicon oxynitride film in two different chambers of an integrated processing system, wherein a structure comprising a silicon oxide film formed on a silicon substrate is heated in an atmosphere comprising NH_3 in a first chamber and exposed to a plasma comprising a nitrogen source in a second processing chamber. Applicants respectfully submit that *Kiryu, et al.*'s description of a processing system that includes different types of processing chambers is not sufficient to provide a suggestion or motivation for forming *Cheng, et al.'s* silicon oxynitride layer in two different chambers of the system.

Regarding the Examiner's assertion in the Final Office Action (point 2 on page 3) that in using *Cheng, et al.'s* process, it would have been obvious to modify the processing system of *Kiryu, et al.* to include using different chambers for each step of the process to avoid contamination of the substrate, Applicants respectfully submit that

Cheng, et al.'s and *Kiryu, et al.*, individually, or in combination, do not teach or suggest using different chambers of a cluster tool for each step of a process to avoid contamination of a substrate. Instead, *Kiryu, et al.* teaches that two different steps of the process described therein, *i.e.*, the deposition of the first and second insulation films, may be performed in one chamber, thus reducing the burden required for manufacturing (paragraph [0008]).

Thus, *Cheng, et al.* in view of *Kiryu, et al.* does not teach, show, or suggest a method of forming a gate dielectric in an integrated processing system, comprising heating a structure comprising a silicon oxide film formed on a silicon substrate in an atmosphere comprising NH_3 in a first processing chamber of the integrated processing system to incorporate nitrogen into the silicon oxide film, transferring the structure to a second processing chamber of the integrated processing system, and then exposing the structure to a plasma comprising a nitrogen source in the second processing chamber to form a silicon oxynitride gate dielectric on the substrate, as recited in claim 10. Applicants respectfully request withdrawal of the rejection of claim 10 and of claims 11-12, 14, and 16, which depend thereon.

Applicants further traverse the rejection of dependent claim 12. As discussed above, *Kiryu, et al.* describes forming a silicon oxide film and then incorporating nitrogen into the film in the same chamber. Applicants respectfully submit that *Cheng, et al.* in view of *Kiryu, et al.* does not teach, suggest, or motivate forming a silicon oxide film on a substrate in one chamber, heating a structure comprising the silicon oxide film in an atmosphere comprising NH_3 in another chamber, and exposing the structure to a plasma comprising a nitrogen source in yet another chamber. Applicants respectfully request withdrawal of the rejection of claim 12.

Claims 4 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Cheng et al.* in view of *Kiryu, et al.* and *Niimi, et al.* (U.S. Patent No. 6,548,366 B2). Applicants submit that the rejection of claim 4 is moot as Applicants propose canceling claim 4. Applicants respectfully traverse the rejection of claim 17.

Cheng, et al. and *Kiryu, et al.* are discussed above. *Niimi, et al.* does not teach or suggest forming a silicon oxynitride film in two different chambers, wherein a substrate is heated in an atmosphere comprising NH_3 in one chamber and then

exposed to a plasma comprising a nitrogen source in another chamber. Thus, *Niimi, et al.* does not provide or suggest the elements of independent claim 10 that are not provided or suggested by *Cheng, et al.* in view of *Kiryu, et al.* Applicants respectfully request withdrawal of the rejection of claim 17, which includes the limitations of claim 10.

Claims 6 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Cheng, et al.* in view of *Kiryu, et al.* and further in view of *Ibok* (U.S. Publication No. 2001/0049186). Applicants submit that the rejection of claim 6 is moot as Applicants propose canceling claim 6. Applicants respectfully traverse the rejection of claim 18.

Ibok does not teach or suggest forming a silicon oxynitride film in two different chambers, wherein a substrate is heated in an atmosphere comprising NH_3 in one chamber and then exposed to a plasma comprising a nitrogen source in another chamber. Thus, *Ibok* does not provide or suggest the elements of independent claim 10 that are not provided or suggested by *Cheng, et al.* in view of *Kiryu, et al.* Applicants respectfully request withdrawal of the rejection of claim 18.

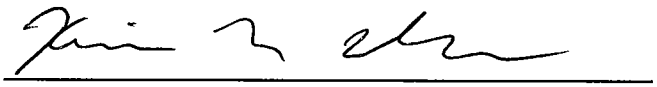
Claims 13 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Cheng et al.* in view of *Kiryu, et al.* and further in view of *Burnham et al.* (U.S. Patent No. 6,649,538 B1). Applicants respectfully traverse the rejection.

Burnham, et al. does not teach or suggest forming a silicon oxynitride film in two different chambers, wherein a substrate is heated in an atmosphere comprising NH_3 in one chamber and then exposed to a plasma comprising a nitrogen source in another chamber. Thus, *Burnham, et al.* does not provide or suggest the elements of independent claim 10 that are not provided or suggested by *Cheng, et al.* in view of *Kiryu, et al.* Applicants respectfully request withdrawal of the rejection of claims 13 and 15.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the Final Office Action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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